CHEMICAL CASE STUDY - CHEMICAL PRODUCER, UK

Hazardous chemical production overhaul

Meeting a daunting challenge and exceeding the client’s expectations.

This hazardous chemical producer needed to increase its production by 20% and improve plant reliability. To do this, three major shutdowns of the plant would have to be implemented.

Shutdown durations would be limited: the ABB design and shutdown management team would have to work in full co-operation with the client’s plant management and operating team. The shutdowns required design to be completed to deadlines, so as to ensure timely material purchase and delivery. Also the congested, contaminated environment would be a test for the skills and capability of both teams.

Additionally, this project was extremely high-profile and would be subject to significant scrutiny.

“The challenge that we faced was daunting, to say the least. The site has never seen such a volume of work carried out in such a short period of time. Nevertheless ABB and the rest of the team attacked the problems with great enthusiasm, tenacity, professionalism and above all, a level of personal commitment well beyond the call of duty. I have been more than delighted and give my heartfelt thanks for the magnificent effort that ABB and the teams have put in and the personal sacrifices that have been made to make the project a success”

Client Project Manager
Solution
The main objectives for ABB were to increase chemical production by better design and material selection, and to plan, manage and complete three back-to-back major plant shutdowns in full (OTIF) to achieve this.

To deliver the client’s business needs, we needed to:
- Supply flexibility of support and responsiveness to those needs
- Work with customers at all levels as one team
- Work with suppliers and sub-contractors in an integrated manner
- Utilise our practical knowledge of Health, Safety and Environmental management in a hazardous operating environment

As a result, we successfully delivered the biggest shutdown of the plant ever undertaken. Site work was executed on a round-the-clock basis to achieve the shortest possible overall duration.

ABB’s HAZCON risk assessment approach was employed during all stages of the project, from initial design through to detailed planning of the shutdowns. The Hazards in Construction (HAZON) process helps address the hidden risks and identify any hidden costs associated with health and safety. This ensured that cost, quality and programme objectives were met.

Regular meetings and weekly communications were held with the material suppliers and the fabrication contractors to ensure delivery of the right materials at the right time.

Scope reviews maintained strict cost control with the budget holders and plant management team. Difficult decision-making ensured that overall budgets were maintained.

We carried out construction risk analyses for each system. These included reliability of the construction equipment and materials availability, as well as labour resources. Unacceptable risks were identified and contingency plans were developed, agreed and implemented.

Working in an integrated manner with the installation contractors and customer created a mutual understanding and, crucially, resulted in buy-in.

We spent much of the management time on the ground during the shutdown, leading by example, auditing and supporting the site operatives. We carried out safety audits in collaboration with the client and the contractors. This made sure that issues were jointly owned and that a no-blame environment prevailed.

Daily HSE, quality, technical and shutdown management meetings were held to share issues and agree actions to resolve problems speedily. This was demonstrated by the smooth handover of the installed work back to the commissioning and plant start-up team.

ABB provided the following services:
- Project, design and engineering management utilising our plant up rate experience
- Construction and shutdown management following our model of turnaround excellence. This is a product of 20 years’ development and proven application, which ensures turnarounds are effectively planned and managed
- Materials procurement and management
- CDM (planning supervisor and principal contractor) duties to ensure the highest level of safety on site
- Design authority during the shutdowns from functional engineers who use their operational experience to make pragmatic judgements
- Commissioning support to the plant management team

Benefits
- Production increased by 20%
- Increased reliability
- Shutdown completed on time and on budget
- To required Health & Safety standards